Team-Based Learning (“TBL”) Overview

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- The presenter is the Commercial Founder of and has a financial interest in CognaLearn. CognaLearn is the company that developed InteDashBoard™ www.intedashboard.com, which is TBL software developed in collaboration with Duke-National University of Singapore Medical School; InteDashBoard™ is one of the technology tools shown in screenshots in this presentation.

Teamwork

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Objectives

After this session participants should be able to:

1. **Define:** team-based learning ("TBL")
2. **Rank benefits:** rank order the top three reasons TBL would benefit students
3. **Rank challenges:** rank order the top three concerns about implementing TBL in the online asynchronous modality

Team-based learning ("TBL")

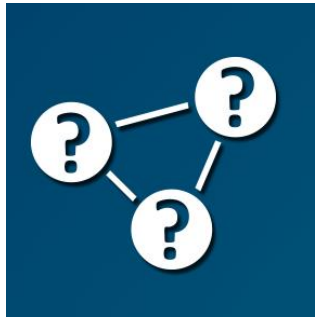
In class: theory

In class: apply

1. Pre-work

2. Quiz

3. Team quiz



4. Clarify doubts

5. Team applications

Also 360° teammate evaluation

TBL in practice

Originated in 1970s by Larry Michaelsen in Marketing

Used by 100s of universities globally

FIU Florida International University
UCF
UF University of Florida
Columbia University in the City of New York
Duke University
DukeNUS Medical School
Macquarie University Sydney·Australia
Imperial College London
Lee Kong Chian School of Medicine
Deakin University Australia
Nanyang Technological University
SIT Singapore Institute of Technology
UCLA
Yale NUS College
UIC College of Nursing
University of South Alabama
Yale

Many fields

- Health sciences (~50% of US medical schools)
- Business
- Computer science
- Engineering
- Social sciences
- Law

Emerging K-12, government, employability and corporate

NYP Nanyang The Innovative Polytechnic
Spectra Secondary School
AETS Australian Employment Training Solutions
Bayer
gsk
Merck
Ngee Ann Polytechnic
PUB Water for All: Conserve, Value, Enjoy
KPMG
Johnson & Johnson
Pfizer
Takeda

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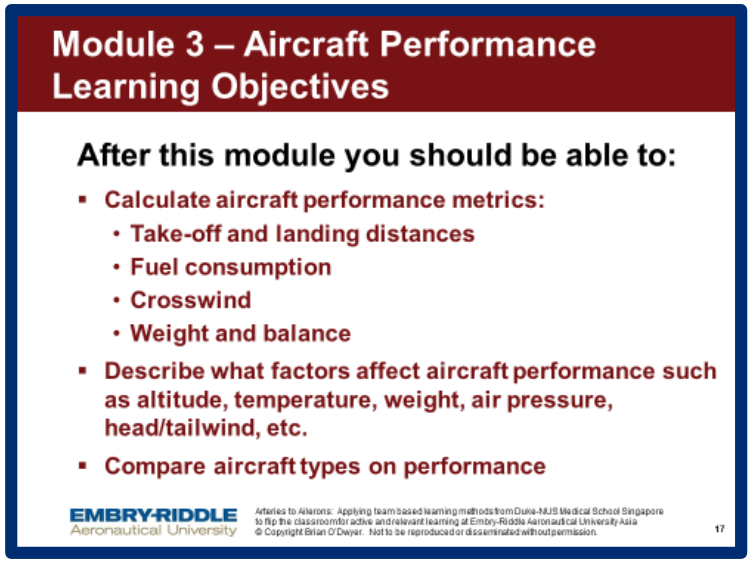
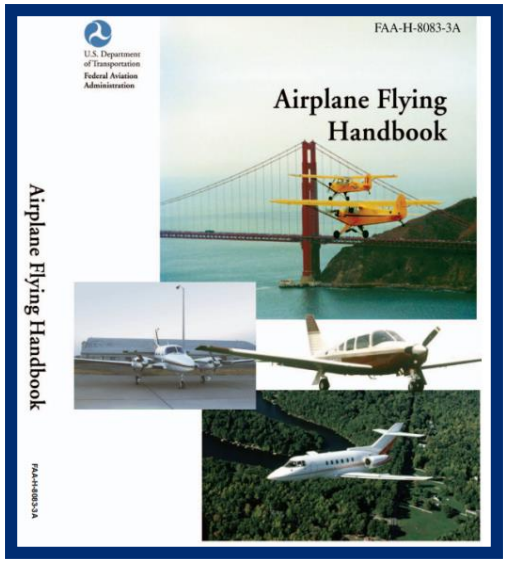
1. Pre-work





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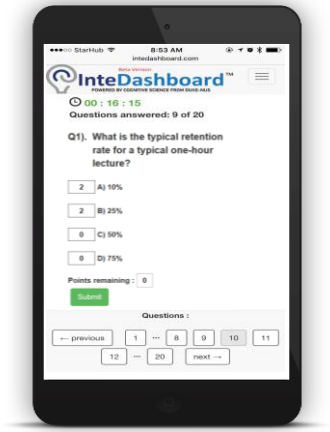
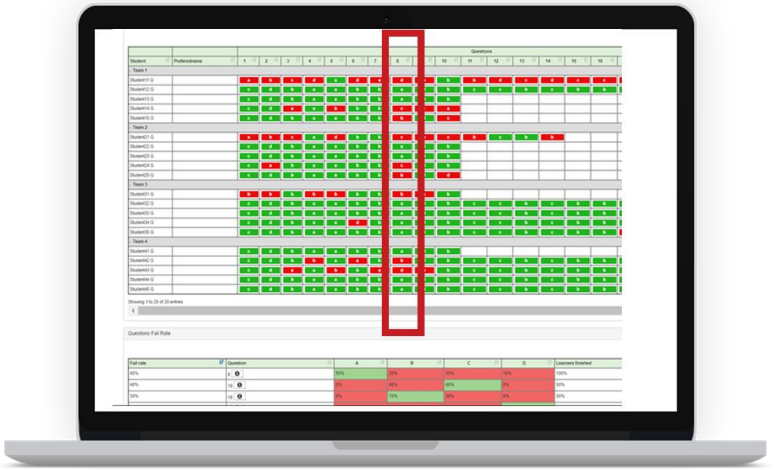
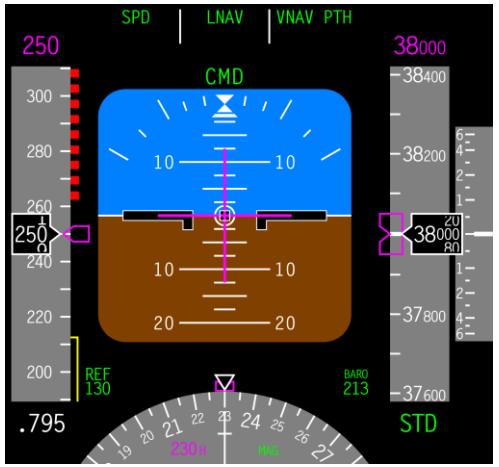
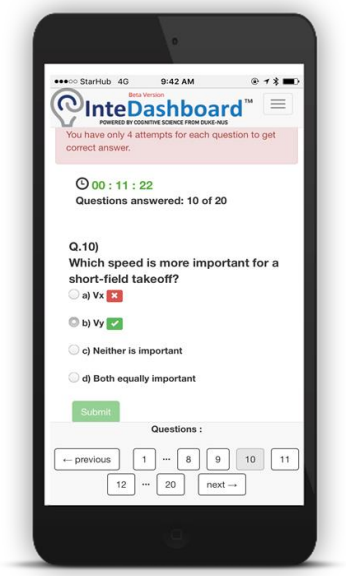
2. Individual Readiness Assurance Test ("IRAT")

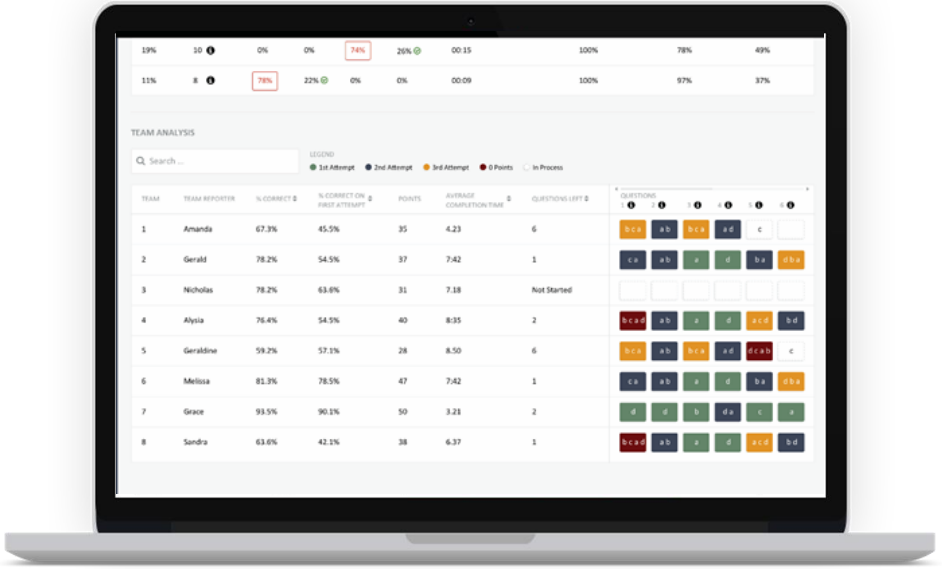






3. *Team* Readiness Assurance Test ("TRAT") with *immediate feedback*





4. Clarifications

5. Applications

Significant problem
Same problem
Specific choice
Simultaneous report

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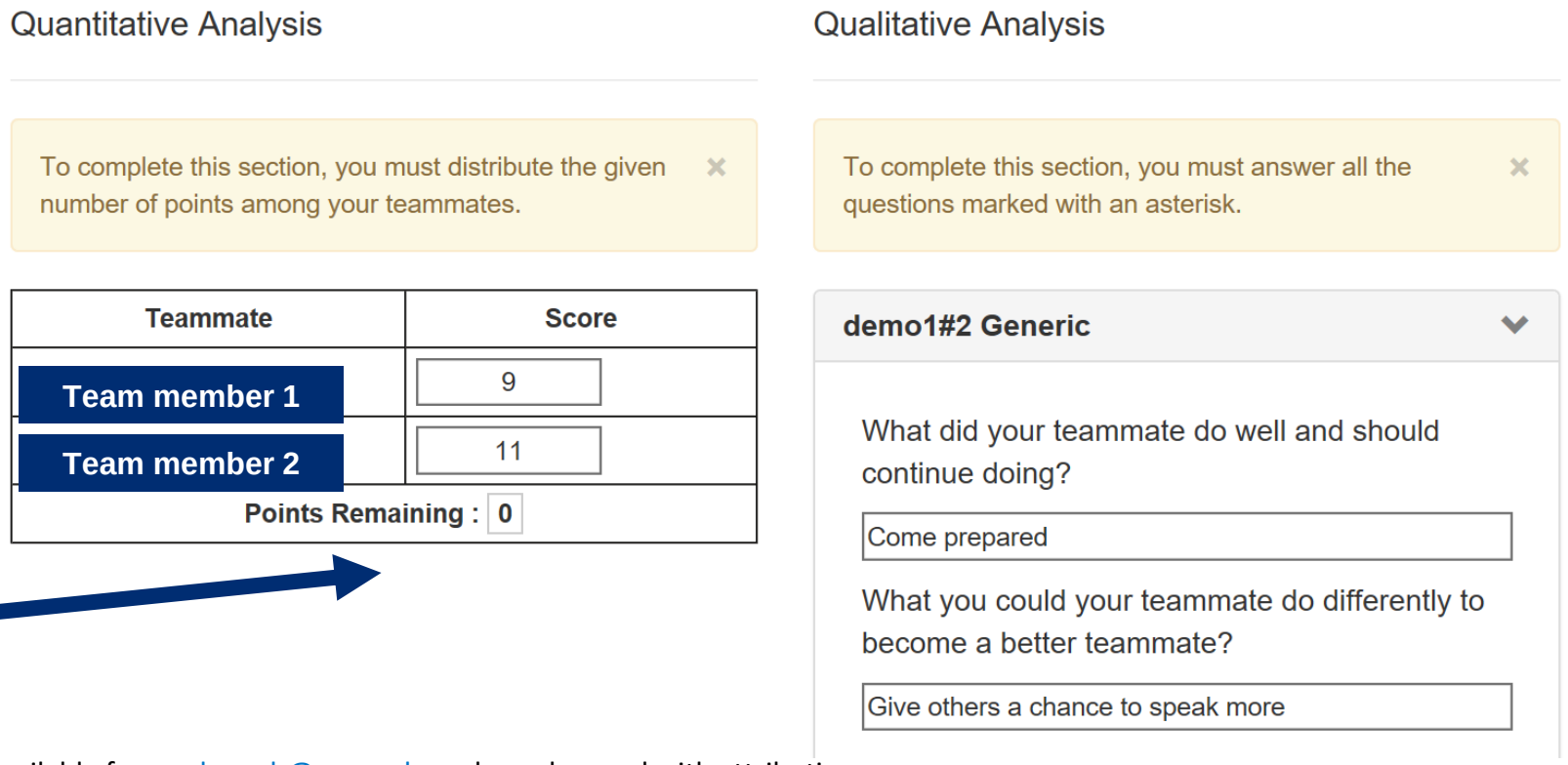
Peer evaluation

- Team members “grade” each other on their performance as team members
  - Mitigates “free rider” problem
  - Learn by evaluating performance



Divide 20 points among your two teammates

Backwards design

TBL Class Flow

Pre-work **IRAT** **TRAT** **Clarify** **Apply**

Backwards Design

Design RATs **Select pre-work** **Create Application Exercises** **Form Learning Objectives**

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Team formation

- Always instructor created to create a diverse team
- Same teams for the entire term
- 2-3 evaluations per term
- Sizes: typically 5-7 in face-to-face
- Online modalities:
  - Smaller team size (3 or 4)
  - More frequent evaluation

Academic schedule example

3-hour (1x per week)

Readiness Phase (75 min)

- IRAT (20 MCQ) 25 min
- TRAT (20 MCQ) 25 min
- Clarify doubts 25 min

[Break]

Application Phase (75 min)

- Application cases 3-6x (5-15 min each)

1-hour (3x per week)

Monday

- IRAT (10 MCQ) 15 min
- TRAT (10 MCQ) 15 min
- Clarify doubts 30 min

Wednesday

- Cases ~3x (5-15 min each)

Friday

- Cases ~3x (5-15 min each)

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Online synchronous

- Generally similar to face-to-face
- Can take longer
- Technology coordination
- Smaller team sizes
- More frequent peer evaluation (in academic context)

Online asynchronous example

Three weeks per topic

Week 1:

Readings and pre-work

Week 2/3:

Monday: IRAT (24 hours)

Tue-Wed: TRAT (48 hours)

Thur-Tue: Applications (6 days)

Wed-Sun: Applications discussion (5 days)

One week per topic

Monday/Tuesday

- IRAT

Wednesday/Thursday

- TRAT

Friday/Saturday

- Application exercises

Implementing TBL at ERAU

Short-term

- **Prework:** largely done already
- **Theory:** run existing quizzes first as individual and then as a team (Canvas calls them "groups")
- **Applications:** use existing cases and…
  a) *Team cases:* Team cases instead of individual
  b) *Same problem:* All teams work on the same problem (e.g. same airport)
  c) *Specific choice:* Solution is a specific choice or business decision (which aircraft; rank the top three reasons for or against a decision)
  d) *Reporting and debrief:* Teams select or vote for the best response other than their own
- **Teammate evaluation:** peer grading, divide up points or comments

Long-term

Consider instructional design with TBL in mind, immediate feedback on team quizzes, team clarifications, electronic gallery walks, anonymous peer evaluation reporting and AI teammates

Reflect and report

1. **Benefits:** rank order top three reasons TBL would benefit students
2. **Challenges:** rank order the top three concerns about implementing TBL in the online asynchronous modality

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Benefits: results of chat feedback

- Fosters desirable qualities of future employees
- Real world experience
- Students learn to work together
- Students learn to collaborate
- Students learn to make a decision
- students learn to back up their decision
- Great venue for applying course concepts to real-world / aviation applications
- I love that idea of taking the test as a team and discussing the answers.
- I love the idea of making students make a decision.
- My dissertation topic is on the subject of student-to-student interactions, more so as it applies to developing social presence. However, SSI to support learning is equally interesting
- Real-world experiences tackling issues and finding solutions.
- Looking at an issue from all sides and considering other possibilities
- Structure
- Students learn to collaborate with a team
- Giving them an experience of collaborating virtually is an important skill

Challenges: results of chat feedback

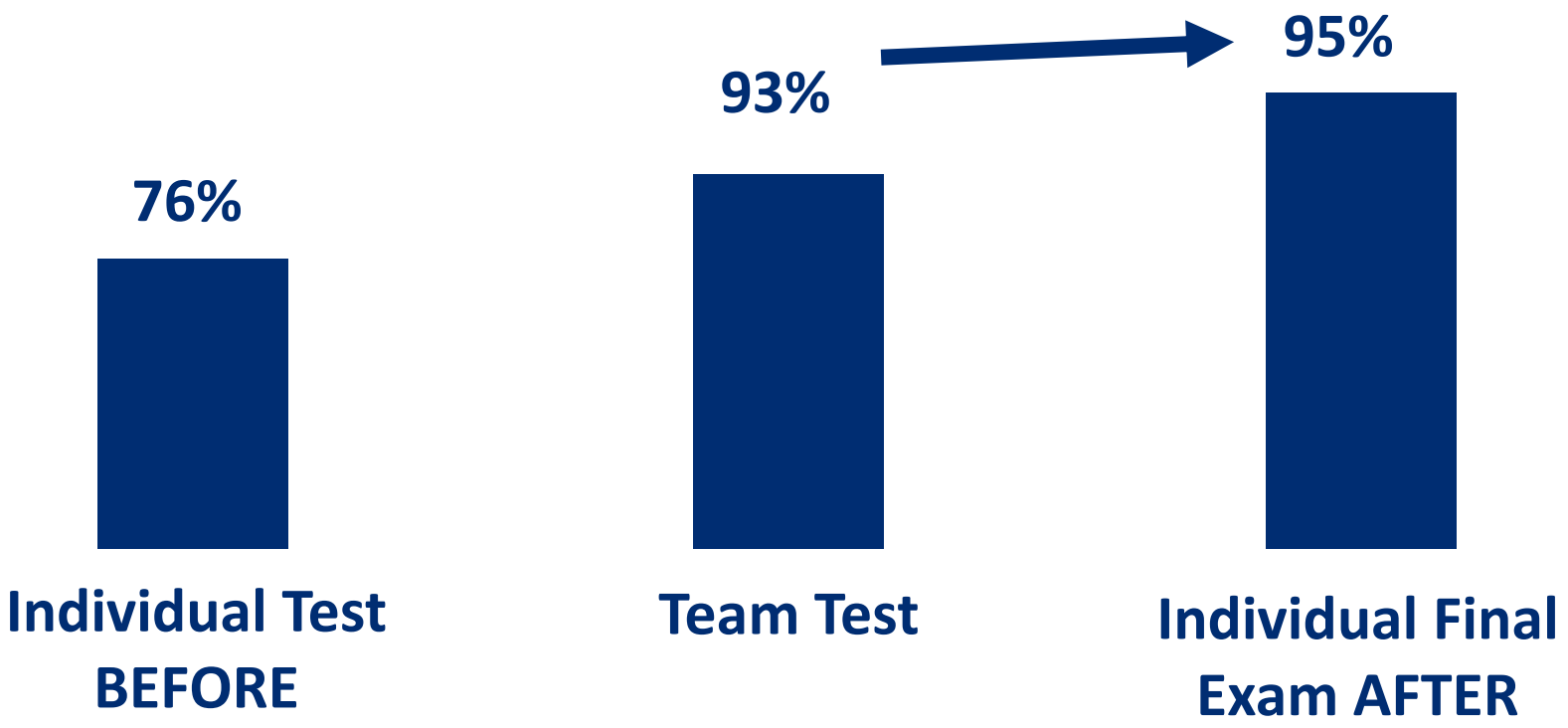
- People on the team pulling their weight
- accountability; asynchronous logistics;
- 9 weeks terms are so packed, it may be hard to focus on a project like this and the other assignments
- Students coordinating team assignments across time zones.
- What about accountability? Will some students benefit from other students' hard work?
- Do you foresee any challenges with the text-based nature of communication?
- Students don't seem to be easily able to understand the LMS group area to its maximum potential. Every class that has a group assignments should have a LMS how to video.

Summary

- **Team-based learning ("TBL"):** specific type of blended learning
  - Theory: Pre-work followed by individual and team testing then clarification
  - Application: **S**ignificant, **S**ame, **S**pecific choice and **S**imultaneous report
  - Teams: Instructor created with teammate peer evaluation
- **Mission critical team environments:** used in health sciences (medicine and nursing)
- **Modality:** Originated in face-to-face environments, expanding to online
- **Learn more:** Team-Based Learning Collaborative
  - www.teambasedlearning.org
  - Annual meeting: March 14-16 2019 in Tampa (ERAU Prescott faculty attended in 2018)
  - Best Practices for Online Team-Based Learning whitepaper available here

Appendix

My class: individuals retain team gains



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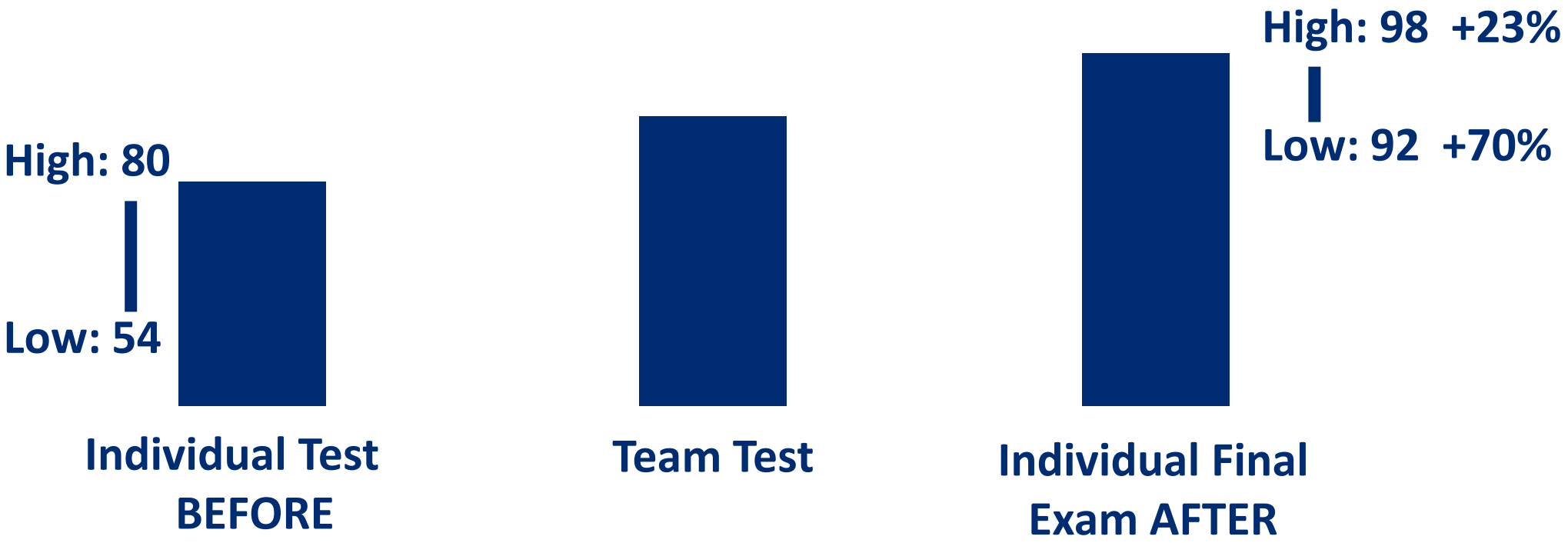
My class: high-low range narrows



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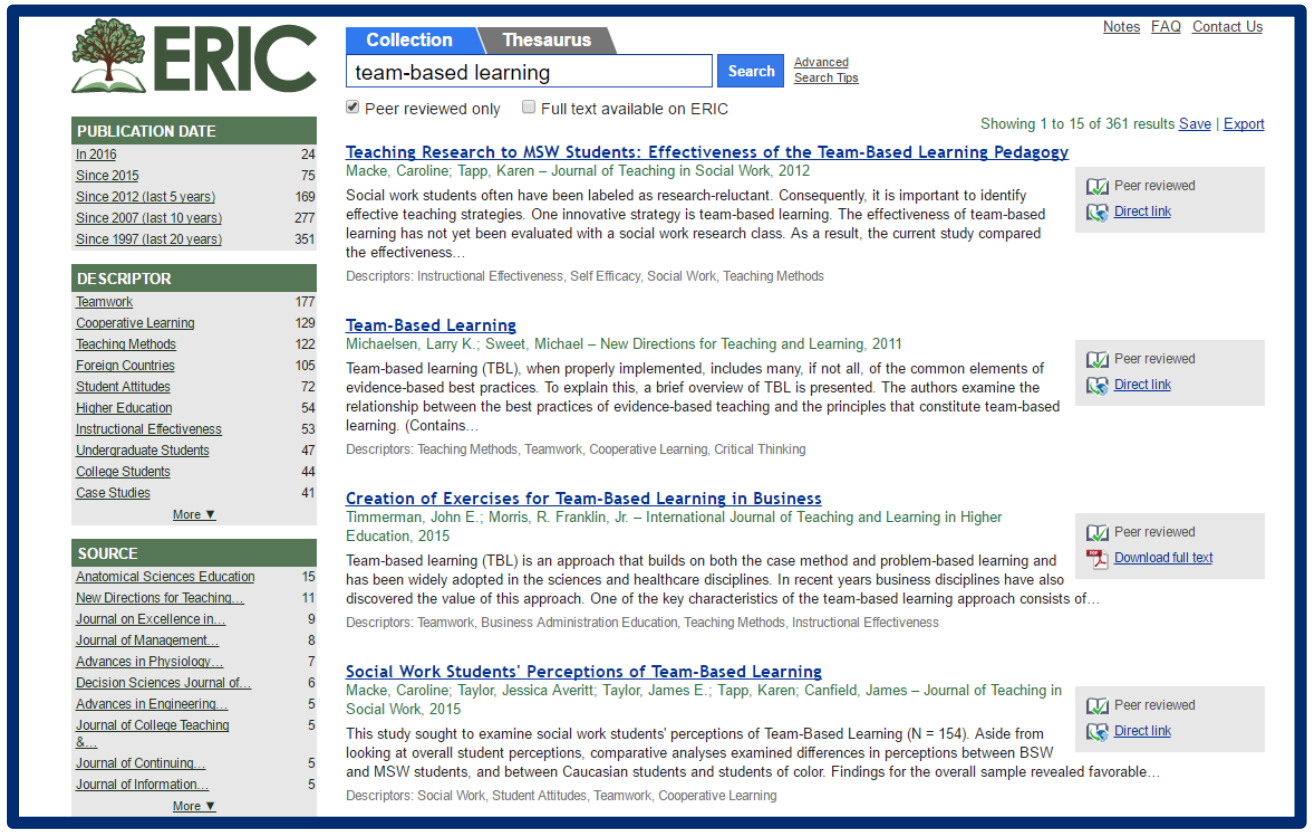
World Economic Forum future skills

Top 10 skills required in 2020	Lecture	TBL
1. Complex Problem Solving		✓
2. Critical Thinking		✓
3. Creativity		
4. People Management		✓
5. Coordinating with Others		✓
6. Emotional Intelligence		
7. Judgement and Decision Making		✓
8. Service Orientation		
9. Negotiation		✓
10. Cognitive Flexibility		

World Economic Forum Future of Jobs Report-http://reports.weforum.org/future-of-jobs-2016/shareable-infographics/

TBL supported by research

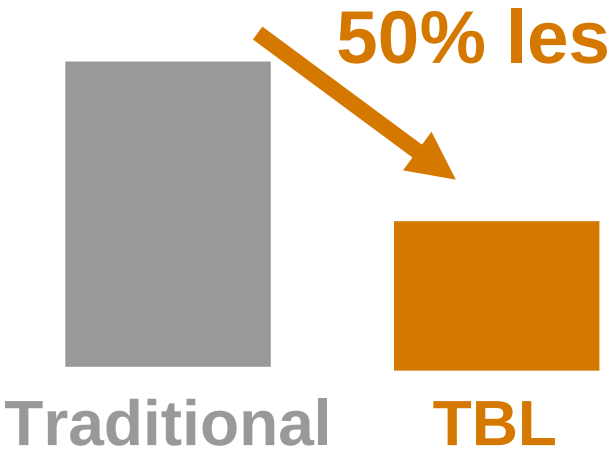


300+ journal articles

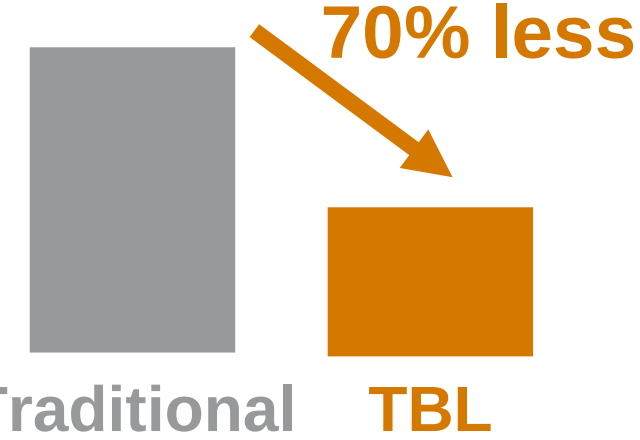
Curriculum and resource savings

DukeNUS Medical School

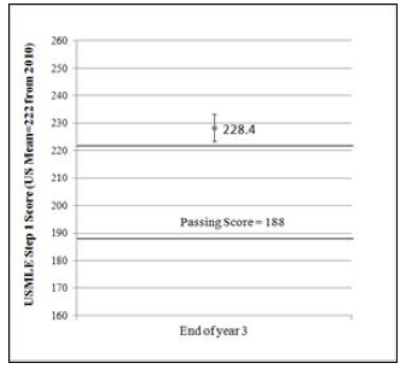
Classroom time



Faculty time



Better exam scores



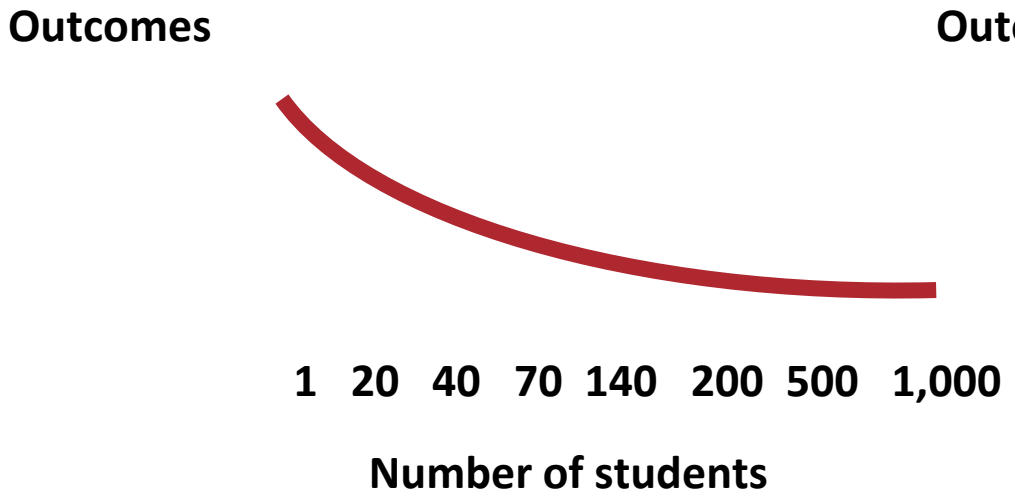
Kamei RK, Cook S, Puthucheary J, Starmer CF. Medical Science Educator. 22: 2012.

Note: Classroom and faculty time are unpublished estimates. Exam scores versus US national average published as cited..

Effectiveness in large classes

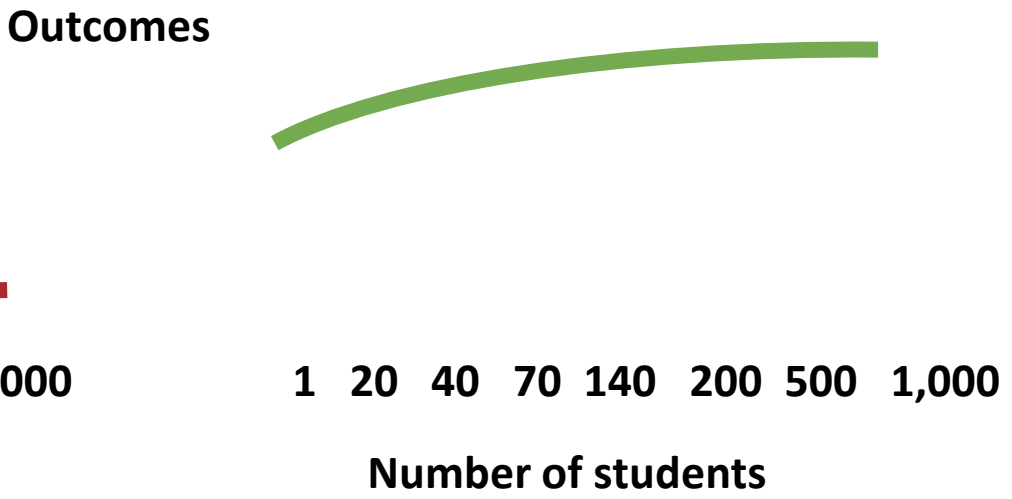
Traditional class

Outcomes ***decline*** as class size increases



TBL class

Outcomes ***rise*** and ***maintain*** better as class size increases



Illustrative

Considerations

- Design of TBL course materials (pre-work, questions and cases)
- Change management for educators and learners
- Administrative process to implement

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Applications

Applications are the heart of the TBL process and should closely be aligned to learning objectives. Three main types of applications:

1. **Choose:**
2. **Critique:**
3. **Create:**

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Application example: choose

The government is considering privatizing Changi airport

1. Rank order the top three reasons *for / against?*

2. Would you pursue this policy?

    a) Strongly agree b) agree c) neutral d) disagree e) strongly disagree

3. Rank order the top three risks of policy.

4. What would you change or do to mitigate the risks of this policy?

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Application example: critique

Please review the:

[learning objective] or [training agenda] or [policy memo] or [invitation to quote for GeBiz] or [grant application] or [email to citizens]

And:

1. **Approve or reject**
2. **If reject, state reason for rejection**
3. **If reject, modify it to make it acceptable**

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Application: service critique examples

Review the video of the customer agent x interaction with a customer

1. Rank order the top three things they did well
2. Rank order the top three things could do better
3. How would you train the to respond to the question X given by the customer?

    a) this b) that c) something else

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Application: create example

The Civil Service College will be launching a new training on how to use data analytics and technology to enhance training outcomes and reduce cost.

Draft a learning objective for this new training

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